ABSTRACT

[0253] A wireless system and method for determining the location of a fixed or mobile subject or object includes a transponder disposed on the target, a transceiver for monitoring the location of the target, a wireless communication system operating on at least one Radio Frequency (RF) band configured to allow communication between the transponder and the transceiver, and a processor configured to find the target by virtual triangulation based on values of position information received from the transponder and the transceiver. The processor is configured to determine virtual triangulation based on successive values of the position information using at least three points P_1, P_2 and P_3 of the transponder respective of the transceiver. The processor can include a means for position ambiguity reduction (PAR) configured to find the target by correcting the direction to the location of the target T based on the values of the position information. The processor can also determine the position of the target based on the average speed of the motion of the user of the transponder respective of the transceiver. Furthermore, the processor can determine virtual triangulation based on successive values of the position information from user input on the transceiver. The method finding the target T ("finder" techniques) based on one or more position determination principles including determining the position of the target using virtual triangulation between the master or monitoring unit and at least one target T, whereby the monitoring device M_s measures the distance between it and the slave unit and, alternatively, in addition to measuring the distance between itself and the slave unit, between itself and another monitoring unit, or the monitoring device M_s measures the distance between its own successive locations. The present invention also discloses methods for finding with virtual triangulation by: (1) finding with virtual triangulation by generating position information in real-time, in the case of (i) stationary and moving target, and or (ii) in the case of the presence of obstacles; (2) finding with virtual triangulation relating to the average speed of the motion of operator; and or (3) finding with simplified virtual triangulation, whereby the user-device interaction is minimized – eliminating the need for monitoring device M_s to measure the distance between its

own successive locations as well as the user's signaling to the monitoring or master unit when in motion or during stops.